

Does detection of chlamydial antibodies by microimmunofluorescence help in managing chlamydial lower genital tract infection in women?

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SUMMARY A total of 113 women thought to have chlamydial infection of the lower genital tract were studied prospectively to evaluate the effect of antibiotic treatment on antibodies to chlamydiae detected by microimmunofluorescence. Of them, 81 were randomly selected for treatment with a two week course of either triple tetracycline or erythromycin stearate, and 32 who had microimmunofluorescent antibodies to, but did not yield cultures for, chlamydiae were used as controls and left untreated. Results for the treated patients showed that 22 (27%) had at least a fourfold fall in the microimmunofluorescent titre, but there was a similar rise in titre in 14 (17%), and the titre remained unaltered in 45 (56%) patients. In the control group 10 (31%) patients had at least a fourfold fall in titre, but there was a similar rise in titre in seven (22%), and it remained unaltered in 15 (47%) patients. The differences between these percentages in treated and untreated patients were not significant.

Introduction

Chlamydia trachomatis is currently recognised as one of the most common sexually transmitted pathogens, which has an expanding clinical role.^{1,2} Like gonorrhoea, chlamydial infection of the female genital tract is usually asymptomatic in the initial stages. Methods based on detecting chlamydial intracytoplasmic inclusions in Giemsa stained conjunctival, urethral, or cervical scrapings have been replaced by tissue culture techniques. As facilities for tissue culture are not readily available, attempts have been made to use chlamydial antibody methods.^{3,4} The purpose of this study was to evaluate the effect of antibiotic treatment on antibodies detected by microimmunofluorescence to chlamydiae in women patients thought to have had chlamydial infection of the lower genital tract.

Patients and methods

We studied 150 non-pregnant women whose serum contained IgG chlamydial antibodies at a titre of

$\geq 1/32$ who attended St Luke's Clinic, Manchester, and the special clinics at Stockport and Bolton. Of the 150 women, 37 did not attend for their three month follow up and were therefore excluded from the final analysis. Thus 113 patients (mean age 24 (range 15-47) years) were analysed, of whom 81 were asymptomatic (18 were sexual contacts of men with non-gonococcal urethritis, 25 were contacts of men with gonorrhoea, and 38 had attended for a routine check) and 32 were symptomatic (complaining of vaginal discharge or pruritus vulvae, or both).

At the first visit all patients were routinely screened for gonorrhoea, trichomoniasis, and candidiasis, and cervical cytology was undertaken. An endocervical swab was sent to the laboratory in chlamydia transport medium (2 SP) for the isolation of *Chlamydia trachomatis*. Blood was taken routinely for microimmunofluorescent examination for antibodies to chlamydiae and for serological tests for syphilis.

At the second visit 50 patients who yielded chlamydiae on culture were given a two week course of either triple tetracycline 300 mg twice daily or erythromycin stearate 500 mg twice daily. In each case a cervical culture for chlamydiae taken two weeks after treatment proved negative. One hundred patients who had antibodies (D-K) to chlamydiae but did not yield cultures for *C trachomatis*, were divided randomly into two groups containing 50 patients

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each. One group was treated with either triple tetracycline or erythromycin stearate, and the other group was left untreated.

When the 113 patients attended for follow up three months after treatment, all the initial microbiological investigations were repeated. Except for variations in the antibody titres on microimmunofluorescence, all these tests proved negative.

STATISTICAL METHODS

The two tailed Fishers test of exact probability and the χ^2 test with Yates's correction were used.

Results

Table I shows that of 43 patients treated with erythromycin stearate, all of whom had antibodies to chlamydiae on microimmunofluorescence, 20 (47%) yielded *C. trachomatis* and 23 (53%) were culture negative. The numbers were not large enough for comparison by the χ^2 test, and the difference between the proportions of patients in the two groups whose microimmunofluorescent titre fell was not significant (two tailed Fishers test of exact probability, $p > 0.1$).

TABLE I Changes in titres of antibodies to *Chlamydia trachomatis* detected by microimmunofluorescence tests of serum from 43 women treated with erythromycin stearate

Chlamydial culture	No (%) whose serum titre was:		
	Reduced	Raised	Unchanged
Positive (n = 20)	10 (50)*	3 (15)	7 (35)
Negative (n = 23)	6 (26)*	5 (22)	12 (52)

* $p > 0.01$, two tailed Fisher's test of exact probability (not significant).

Table II shows that of 38 patients treated with triple tetracycline, all of whom were positive on microimmunofluorescence, 14 (37%) yielded chlamydial cultures and 24 (63%) were culture negative. Although there was a slight difference between the proportions of patients in the two groups whose titre fell, the difference was not significant (two tailed Fishers test of exact probability, $p > 0.1$).

TABLE II Changes in titres of antibodies to *Chlamydia trachomatis* detected by microimmunofluorescence tests of serum from 38 women treated with triple tetracycline

Chlamydial culture	No (%) whose serum titre was:		
	Reduced	Raised	Unchanged
Positive (n = 14)	4 (29)*	3 (21)	7 (50)
Negative (n = 24)	2 (8)*	3 (13)	19 (79)

* $p > 0.01$, two tailed Fisher's test of exact probability (not significant).

TABLE III Changes in titres of antibodies to *Chlamydia trachomatis* detected by microimmunofluorescence tests of serum from 81 treated women

Chlamydial culture	No (%) whose serum titre was:		
	Reduced	Raised	Unchanged
Negative (n = 47)	8 (17)*	8 (17)	31 (66)
Positive (n = 34)	14 (41)*	6 (18)	14 (41)

* $\chi^2 = 4.66$, df = 1, $p = 0.029$.

Table III shows the results for all 81 treated patients. In the chlamydia culture negative group (47 patients), eight (17%) showed a decrease in the titre of antibody to chlamydiae in their serum, whereas 14 (41%) of the chlamydia positive group (34 patients) showed a fall in titre. This difference was statistically significant ($\chi^2 = 4.66$, df = 1, $p = 0.029$). However, when the results for the untreated and treated patients were compared (table IV) the difference between the proportions of patients whose serum showed a reduction in titre was not significant ($\chi^2 = 0.5$, df = 1).

TABLE IV Comparison of changes in chlamydial antibody titres on microimmunofluorescence tests of serum from untreated and treated patients

Patients (n = 113)	No (%) whose serum titre was:		
	Reduced	Raised	Unchanged
Untreated (n = 32)	10 (31)*	7 (22)	15 (47)
Treated (n = 81)	22 (27)*	14 (17)	45 (56)

* $\chi^2 = 0.5$, df = 1 (not significant).

Discussion

Chlamydial antibodies have been found in 23-40% of normal adults,^{5,6} and McComb *et al* found antibodies in 38% of women college students 23% of whom denied having had sexual intercourse.⁷ In many studies a high proportion of women have been found to have antibodies, although they did not yield chlamydiae on culture.⁸⁻¹⁰ It has been suggested that these antibodies may be due to either some latent untreated⁸ or previously treated¹¹ chlamydial infection.

Several patients from whom chlamydiae can be isolated on culture but who have no detectable specific antibody will be treated in our clinics; if treatment depends solely on the presence of chlamydial antibodies on microimmunofluorescence, then many patients will go untreated or be treated unnecessarily. In the study reported here the titre in the serum of 56% of patients remained unchanged after treatment and declined in only 27%, but in 17%

the titre increased. Furthermore, there seems to be no significant difference between the proportions of untreated and treated patients whose titre had fallen. A decline in the titre of chlamydial antibodies may be taken as an index of the success of treatment. It seems logical to assume, therefore, that chlamydial antibodies may prove useful in understanding the chlamydial diseases and their epidemiology, but may not be helpful in the management of individual patients.

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References

- Schachter J. Chlamydial infections. *N Engl J Med* 1978; **298**:428-35,490-5,540-9.
- Taylor-Robinson D, Thomas BJ. The role of *Chlamydia trachomatis* in genital tract and associated diseases. *J Clin Pathol* 1980; **33**:205-33.
- Treharne JD, Darougar S, Simmons PD, Thin R. Rapid diagnosis of chlamydial infection of the cervix. *British Journal of Venereal Diseases* 1978; **54**:403-8.
- Wang SP, Grayston JT, Alexander ER, Holmes KK. Simplified microimmunofluorescence test with trachoma-lymphogranuloma venereum (*Chlamydia trachomatis*) antigens for use as a screening test for antibody. *J Clin Microbiol* 1975; **1**:250-5.
- Schachter J, Dawson CR. Comparative efficiency of various diagnostic methods for chlamydial infection. In: Hobson D, Holmes KK, eds. *Non-gonococcal urethritis and related infections*. Washington DC: American Society for Microbiology, 1977:337-41.
- Holmes KK, Hansfield HH, Wang SP, et al. Etiology of non-gonococcal urethritis. *N Engl J Med* 1975; **292**:1199-205.
- McComb DE, Nichols RL, Semine DZ, et al. Chlamydia trachomatis in women: antibody in cervical secretions as a possible indication of genital infection. *J Infect Dis* 1979; **139**:628-33.
- Richmond SJ, Caul EO. Fluorescent antibody studies in chlamydial infections. *J Clin Microbiol* 1975; **1**:345-52.
- Saikkku P, Paavonen J. Single antigen immunofluorescence test for chlamydial antibodies. *J Clin Microbiol* 1978; **8**:119-22.
- Richmond SJ, Caul EO. Single antigen indirect immunofluorescence test for screening venereal disease clinic populations for chlamydial antibodies. In: Hobson D, Holmes KK, eds. *Non-gonococcal urethritis and related infections*. Washington DC: American Society for Microbiology 1977:259-65.
- Richmond SJ, Sparling PF. Genital chlamydial infections. *Am J Epidemiol* 1976; **103**:428-35.